

Pesticides and You

News from the National Coalition Against the Misuse of Pesticides (NCAMP)

One in a Series of NCAMP "How-To's"

Understanding Pesticide Resistance

Pesticide resistance, the ability of a pest to withstand a poison, is a predictable consequence of repeated pesticide use. In many cases, pest resistance has resulted in more frequent spraying as growers scramble to destroy the resilient pests, followed by increasing resistance and escalating crop losses. This cycle is often called the pesticide treadmill as growers spray as fast as they can and still lose ground.

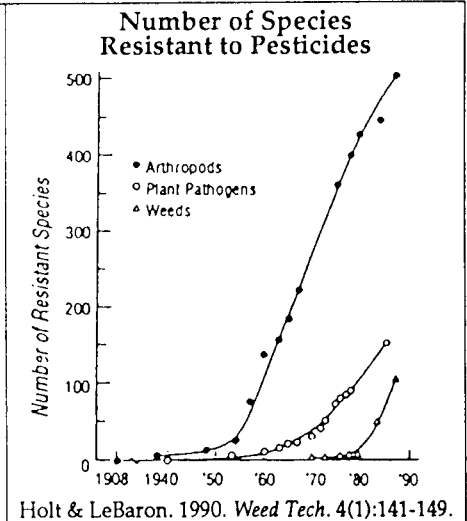
There are now more than 500 species of insects resistant to one or more insecticides, approximately 150 species of resistant plant pathogens (fungal and bacterial diseases), and 113 herbicide resistant weed biotypes.

Organisms can develop resistance

by: 1) developing a means of detoxifying the pesticide; 2) altering the target site (part of the body's metabolism affected by the pesticide) to reduce its sensitivity or the pesticide's ability to bind; or 3) decreasing pesticide penetration. The first two are most common.

A single resistance mechanism can convey resistance to two or more pesticides that have similar modes of action, this is called *cross-resistance*. While *multiple resistance* is the ability to cope with pesticides of different modes of action.

How quickly pesticide resistance develops depends on: the frequency of use, the mechanisms of resistance, the genetics of the resistance mechanism, the size of the gene pool and how quickly



the organisms reproduce. For example, plants have been slower to develop resistance because they have only a few generations each year and a large bank of unexposed plants in the form of seeds in the soil.